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ABSTRACT

Northwest Guilford High School, Guilford County (North Carolina), is an essentially rural, largely white school that serves about 1,200 students from all socioeconomic levels. An evaluation was conducted of a heterogeneous grouping project involving students in a 2-year sequence of algebra for those who scored below the 40th percentile on a standardized mathematics test and the Guided Studies program, which is for students having difficulty in English, science, and social studies. Heterogeneous grouping was begun in 1990-91 in response to the high percentage of students planning postsecondary education and the apparent polarity between college preparatory and vocational students. A survey completed by 18 teachers, interviews with a 4-member Parent Advisory Group, and a survey of the junior class provided information about the program and responses to it. Although teachers reported initial misgivings, they agreed that the change has resulted in better learning and better student grades. Parents were supportive, and student attitudes toward the program were good. Students generally felt that teachers expected more and worked to make sure students had learned the material. Program descriptions and the student survey are attached. (Contains 6 references.) (SLD)

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Evaluation Report on the Northwest Guilford High School Heterogeneous Grouping, Algebra IA and IB, and Guided Studies Programs

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NORTHWEST GUILFORD HIGH SCHOOL HETEROGENEOUS GROUPING PROGRAM

School Background

Northwest Guilford Senior High School, as its names implies, is located in the northwest section of Guilford County. The area is essentially rural although urban growth due to Greensboro and the Triad International Airport is making the area less so. The school serves approximately 1200 ninth through twelfth graders from all socioeconomic levels. The majority of the school's students are white (94%). African-Americans represent 5% and other minorities (Native American, Hispanic, and Asian) represent 1% of the school's population. Less than one percent of the students are eligible for free and reduced lunch. The drop-out rate for the 1991-92 school year was 3.9%. Seventy-six percent of the graduates attend post-secondary institutions.

Dr. Jean Tillman, an assistant principal at Northwest, contacted the two project evaluators in the spring of 1993 in an effort to document some of the changes the Northwest High School staff has made over the past several school years. Subsequently, the project evaluators gathered data and program documentation concerning the heterogeneous grouping of classes in English, science, and social studies, the Guided Studies Program for students who are having difficulty in these courses, and the Algebra IA and IB classes which are a two year sequence of Algebra I for students who scored below the 40th percentile on the math portion of the California Achievement Test. This particular section presents information on the heterogeneous grouping project.

Program Background

The use of heterogeneous grouping began during the 1990-91 school year. This change was implemented across all grade levels. The classes taught heterogeneously were English I-IV, Physical Science, Biology, US History, and Economic, Legal, and Political Systems In Action (ELPSA) (Hereafter, these courses will be denoted as "core courses"). For these eight courses, the General and Fundamental curriculums were discarded. The curriculum and time lines used in these courses were those developed for the College Prep track. In general, the content taught in General and Fundamental classes was different. The content was more job oriented than College Prep classes. In addition, the mode of instruction used more hands-on instruction whereas College Prep classes tended to use the lecture format. Less homework was assigned in the General and Fundamental classes than in College Prep classes.

The switch to heterogeneous grouping in these classes came as a result of several factors. The first factor was course selection by the students. Fifty-four percent of students were taking

College Prep or Honors classes while 76% of seniors were seeking post-secondary education. Consequently, school staff felt that students were not being adequately prepared for education beyond high school. Secondly, there was a social polarization of the student body due to the differing socioeconomic backgrounds. That is, students from different backgrounds did not intermingle and, as a result, there was a lot of friction between College Prep students and General students. For example, they ate separately and there was bantering in the halls. Mr. Nelson, the principal, said there was a realization that Northwest was really two separate schools, one with college preparatory students and one for vocational students. The anticipated benefits of heterogeneous grouping were that students would learn more by taking a more challenging selection of courses without there being a significant drop in End of Course Test results (A comparison of test scores before and after heterogeneous grouping showed no decrease in test scores), school climate would be improved, and student anti-social behavior would be improved.

Implementation

The project of heterogeneous grouping was undertaken by a committee of twenty teachers as part of a Senate Bill II Incentive Plan. In order to successfully implement the program, one sub-committee focused on exploring instructional strategies which could be used successfully. To that end, teachers observed each other, viewed instructional videos, and read and discussed journal articles. Based on the sub-committee's work, several instructional strategies were subsequently adopted. They were: 1) guided studies which allow students to be tutored in the core courses by their peers, college students, or community volunteers, the use of cooperative learning and hands-on lessons, and 2) an extended day, including "0" period and afternoon classes. This allows some students to take an extra course. The afternoon period is also used by students who have missed too many school days and need to make up class work as well as by students who have not met the core course objectives.

During the 1990-91 school year, project participants met a minimum of six hours to discuss issues related to heterogeneous grouping such as maintaining a brisk pace to assure delivery of the college prep curriculum, integrating non-reading and slow achievers in class, challenging the advanced student, dealing with negative student and parent attitudes, and class presentation strategies. The English, science, and social studies departments met for a minimum of nine hours over the course of the year to work on strategies addressing specific courses, to define parameters of course, and to share experiences. Additionally, project participants attended at least three hours of workshops. Four workshops were given over the course of 1990-91. They were "Involving All Students in Class", "Working with Low Achievers", "Heterogeneous Grouping in Clovis Unified School District", and

"Cooperative Learning".

Reactions to the Heterogeneous Grouping Project

Teacher Reactions

On May 5, 1993, eighteen teachers met with the evaluators for a 30 minute discussion and then completed a short survey about the heterogeneous grouping program. Three of the 18 teachers were in their first year at Northwest and were not included in the analysis. The rest of the teachers had been at Northwest before the switch to heterogeneous grouping was made. The average number of years teaching was 11.6 years with a range between one and 29. There were seven English, five social studies, and three science teachers. The results of the discussion group and survey are described below.

On the survey, teachers were asked how convinced they were, initially, about the use of heterogeneous grouping. Of the 15 responding teachers, seven felt that it would work. One teacher said during the discussion group, "Heterogeneous grouping is the only way to go. With tracking, we were saying to students that they were worth less. The classes were more negative". Three teachers were not convinced and five were unsure whether it would work or not. During the discussion, one teacher commented, "Most people are afraid of change. Teachers were fearful because there was going to be a wider range of students in their classes. Teachers feared having students in chains and leather." Of those teachers who were hesitant, they became convinced after teaching their class heterogeneously. One of these teachers stated that "in actuality, it works quite well in most classes." Another teacher stated that she, since the switch to heterogeneous grouping, has seen an increase in motivation in lower level students. In the discussion group, a teacher noted, when asked about barriers to the project, that there have been fewer complaints each year since the switch has been made.

The roles these teachers played in the switch ranged from teaching heterogeneous classes to being on the planning committee to curriculum development. On the survey, teachers were asked to note any change they had seen in academics, school climate, teacher morale, and student behavior/attitude since heterogeneous grouping was implemented. In terms of achievement, five teachers felt students were learning more. Four others indicated that students were achieving better grades and two teachers felt that academics had improved.

In terms of school climate, three teachers reported fewer discipline problems; three indicated the climate was more open and positive. Three more teachers felt there was more integration between the different socioeconomic levels of students. Two teachers felt there had been no change and two had noted less

elitism at the school. When asked about teacher morale, five teachers felt that it had improved. Three indicated that teacher morale was good and two felt it varied due to frustrations encountered in trying to meet the needs of all students. On the survey and in the discussion group, several teachers mentioned that class sizes were too large.

Regarding student behavior and attitudes, nine teachers felt that they behavior and attitudes had improved. During the discussion group, one teacher commented, "Student behavior is better now. Social acceptance is higher. Students do more (academically) than they used to. They see other people doing things. Really integrated classes are best". Two teachers noted a better mixing of the different types of students. One teacher indicated students had higher expectations and another mentioned higher self-esteem.

Parent Reactions

On May 7, 1993, the SERVE evaluators met with the Parent Advisory Group. The committee is comprised of four parents who are elected by the community for a 2 year term. Committee members are eligible for re-election. All four current members were on the committee before the switch to heterogeneous grouping occurred. When asked about their initial reaction to the idea when Mr. Nelson approached them, they expressed support for the idea. Three of the members were "all for it" and the fourth felt it was the committee's mission to support the administration in its endeavors to improve the school. One parent reflected on her own experience: "My son was just an average student. I felt he could achieve more. His self-esteem went up with the new grouping system...He is in college now and the advanced classes in high school helped him."

There were several areas of concern which the parents mentioned. The first was that some parents of accelerated students were worried that heterogeneous grouping would lower the level of learning. There was also the concern that students would be overextended in terms of the type of work which would be expected of them. Thus, the program needed to be closely monitored. There was also the realization that the new grouping plan was a disruption for the teachers and that it requires more work of the teachers. However, the committee indicated that teachers have said to them that the switch went better than expected.

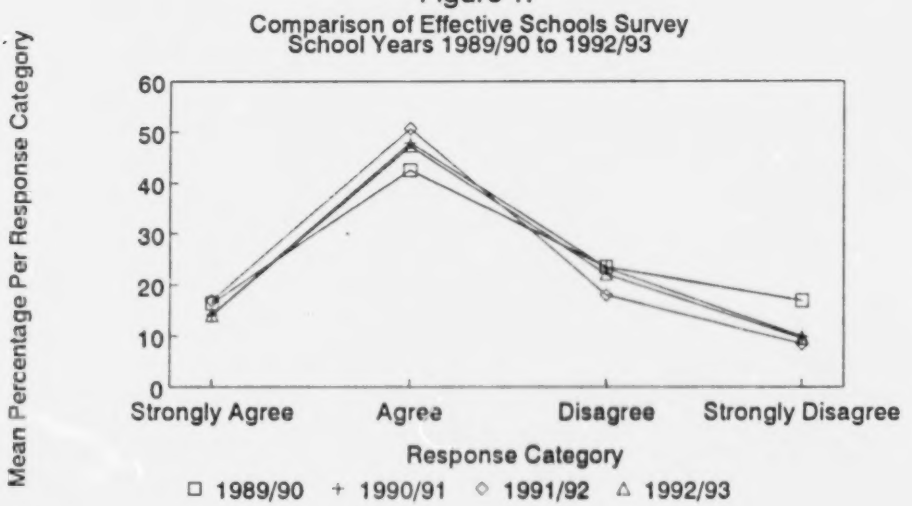
Student Attitudes

Overall School Climate

Each spring, Northwest administers an *Effective Schools Survey* to its junior and seniors classes. The first year of administration was 1989-90, the year before heterogeneous grouping took place. Thus, a comparison of attitudinal data before and

after the project can be made. (Since only junior class data was available for 1989-90 and 1990-91, only junior class data is used in the following analyses). In order to determine if the overall school climate has improved since implementation, a graph (shown in Figure 1) was created showing the mean percentage of responses to each of the four response categories - *strongly agree, agree, disagree, and strongly disagree* - from the 1989-90 school year to the 1992-93 school year. All survey items are positively worded so that the more students agree with the items, the better the school climate. The most noticeable change has been a shift from the percentage of responses away from "strongly disagree." In 1989-90, the percentage was 17%. Each year subsequent has had a maximum of 10%. There has also been an increase in the percentage of responses to "agree" from 43% the year prior to implementation to a minimum of 47% for the 1992-93 school year.

Figure 1.



Student Expectations

In order to achieve a more specific analysis of any shifts in student attitudes as a result of heterogeneous grouping, survey items which were most likely to have been affected, positively or negatively, by heterogeneous grouping were analyzed by year and area in the following tables. Tables 1 gives the responses over the past four years to items related to student expectations. For each of the three items, there is a shift in the percentage of responses from "strongly disagree". This pattern was noted above concerning the overall climate of the school. Approximately the same percentage (around 79%) of juniors felt their teachers expected them to get good grades across the four years. Although, a higher percentage (88%) felt this way in 1992. A greater

percentage of juniors agree with the item, "Most of my teachers encourage me to work hard in class", in the years since implementation, from 70% in the spring of 1990 to an average of 78% the past three years and a minimum of 73%. Additionally, juniors have felt that their teachers more clearly explain their expectations since heterogeneous grouping began (from 55% to a minimum of 62%).

Table 1: Junior class responses to items related to student expectations, by school year

Item	Year	Strongly Agree	Agree	Disagree	Strongly Disagree
My teachers expect me to get good grades on assigned work and tests.	1990	27%	53%	11%	9%
	1991	24%	54%	14%	8%
	1992	34%	54%	8%	1%
	1993	23%	56%	12%	4%
Most of my teachers encourage me to work hard in class.	1990	17%	53%	20%	11%
	1991	20%	57%	18%	2%
	1992	24%	59%	12%	2%
	1993	15%	58%	17%	6%
My teachers clearly explain what we are expected to learn in each course.	1990	8%	47%	33%	12%
	1991	10%	52%	30%	6%
	1992	14%	60%	18%	5%
	1993	12%	54%	21%	8%

Student Classroom Experiences

The results of items in Table 2 relate to student experiences in the classroom. Since implementation of heterogeneous grouping, the percentage of juniors indicating they have learned a lot in their classes has increased from 61% in 1990 to a minimum of 66% and an average of 73% since. The percentage indicating their teachers give all students chances to answer questions has remained approximately the same (around 59%). The percentage reporting their teachers' willingness to help students having difficulty has remained about the same, although, a greater percentage of juniors strongly agree with the statement since implementation. More juniors (48% to a minimum of 52% and an average of 54%) feel the teachers treat all students as if they can learn. The responses to the item, "Low achieving students receive as much attention in this school as high achieving students", has remained approximately the same.

Table 2: Junior class responses to items related to classroom climate, by school year

Item	Year	Strongly Agree	Agree	Disagree	Strongly Disagree
The teachers at this school treat all students as if they can learn.	1990	10%	38%	29%	23%
	1991	7%	46%	29%	2%
	1992	17%	39%	25%	15%
	1993	12%	40%	26%	14%
Teachers are willing to help students who don't understand work.	1990	9%	55%	21%	15%
	1991	16%	50%	26%	6%
	1992	17%	61%	10%	6%
	1993	14%	49%	24%	6%
My teachers give <u>all</u> students a chance to answer questions or make comments in class.	1990	9%	49%	32%	29%
	1991	10%	52%	31%	30%
	1992	12%	50%	27%	34%
	1993	11%	45%	31%	26%
Low achieving students receive as much attention in this school as high achieving students	1990	7%	22%	32%	29%
	1991	7%	24%	31%	30%
	1992	6%	21%	27%	34%
	1993	6%	26%	31%	26%
I feel that I learn a lot in my class.	1990	11%	50%	27%	12%
	1991	8%	61%	18%	7%
	1992	15%	60%	15%	5%
	1993	12%	54%	18%	7%

Teacher Academic Expectations

Table 3 below gives the responses to items related to teacher academic expectations. Across the five items, the percentage of juniors responding "strongly disagree" has decreased since implementation of heterogeneous. In particular, the percentage of juniors strongly disagreeing with the statement, "In general, my teachers make sure I have learned material before they move on to new material", decreased from 40% in 1990 to 21% in 1991. The percentage of juniors agreeing with this statement increased from 30% to a minimum of 36%. In addition, the percentage indicating their teachers assign homework regularly increased from 75% to a minimum of 82%. Interestingly, juniors' perception of their teachers encouraging them to think increased from 67% in 1990 to 79% in 1991 and 1992 then decreased in 1993 to 63%. The responses to items concerned with teachers giving tests and grading fairly have remained fairly stable, although there has been a slight decrease in the percentage indicating "strongly disagree".

Table 3: Junior class responses to items related to academic press by teachers, by school year

Item	Year	Strongly Agree	Agree	Disagree	Strongly Disagree
Teachers in this school really stress academic achievement.	1990	13%	60%	18%	9%
	1991	16%	62%	17%	4%
	1992	20%	65%	10%	1%
	1993	17%	62%	10%	4%
In general, my teachers make sure I have learned material before they move on to new material.	1990	4%	26%	30%	40%
	1991	7%	29%	41%	21%
	1992	7%	36%	40%	13%
	1993	5%	34%	35%	21%
My teachers encourage students to think for themselves.	1990	9%	58%	19%	14%
	1991	14%	65%	14%	4%
	1992	14%	65%	13%	3%
	1993	10%	53%	25%	5%
Most of my teachers regularly assign homework.	1990	33%	42%	14%	11%
	1991	41%	43%	12%	0%
	1992	40%	50%	7%	1%
	1993	35%	47%	12%	2%
Most of my teachers give tests regularly.	1990	25%	57%	9%	9%
	1991	23%	56%	9%	2%
	1992	35%	57%	4%	2%
	1993	26%	58%	8%	4%
Most of my teachers grade fairly.	1990	13%	59%	16%	12%
	1991	17%	52%	17%	6%
	1992	18%	61%	11%	7%
	1993	13%	57%	15%	8%

School Academic Expectations

Junior responses to items related to academic expectations of the school and its students are given in Table 4. Again, there is the general pattern of fewer students strongly disagreeing with these statements since implementation of heterogeneous grouping. Since implementation, more juniors have felt that Northwest makes students want to learn (from 30% to an average of 40% and a minimum of 36%). There have also been slight increases in the percentage of juniors who agreed that students at Northwest are serious about their education and that there is a strong "push" for high academic achievement.

Table 4: Junior class responses to items related to academic press by the school and students, by school year

Item	Year	Strongly Agree	Agree	Disagree	Strongly Disagree
Students in this school are serious about their education.	1990	3%	41%	37%	19%
	1991	2%	46%	47%	2%
	1992	2%	52%	29%	4%
	1993	4%	44%	35%	7%
At this school there is a strong "push" for high academic achievement.	1990	7%	43%	38%	12%
	1991	9%	47%	40%	4%
	1992	13%	46%	28%	4%
	1993	10%	44%	30%	7%
This school makes students want to learn.	1990	3%	27%	41%	29%
	1991	3%	33%	43%	13%
	1992	4%	42%	33%	12%
	1993	4%	35%	36%	14%

Conclusions

The switch to heterogeneous grouping at Northwest High School was made during the 1990-91 school year. At that time approximately half of the teachers surveyed were unsure whether or not the concept would work. Yet after teaching heterogeneous classes, these teachers became convinced. Since the change was made, a majority of the teachers surveyed felt that students were learning more and getting better grades. Most of the teachers felt that school climate had improved. This improvement included student behavior and more interaction between students of differing socioeconomic levels. Most of the teachers felt that teacher morale had also improved.

Members of the Parent Advisory Group were supportive of the program from the beginning. They felt that, prior to implementation, there was too large a gap between the different groups of students. They also realized that the switch to heterogeneous grouping would require additional work of teachers. They continue to support the program as well as teachers' and administrators' efforts to improve Northwest.

Any changes in student attitude as a result of the switch to heterogeneous grouping were assessed by the results of the *Effective Schools Survey* which was first administered the school year before the change took place. The most noticeable change in overall school climate has been a shift away from those students "strongly disagreeing" with the survey items and a subsequent increase in the percentage of students "agreeing" with the items.

Student responses in the area of student expectations showed that more students felt that teachers encouraged them to work hard in class and teachers' expectations for the students were clearer. About the same percentage of students felt that teachers expected them to get good grades. Responses to items concerning student classroom experiences showed that more students felt they were learning a lot and that teachers treated students as if they could learn. About the same percentage of students felt that teachers paid as much attention to low achieving students as high achieving students.

Student responses regarding academic expectations by their teachers indicated a higher percentage of students felt their teachers made sure they had learned material before moving on to new material. More students also reported that teachers regularly assigned homework. Responses to items concerning academic expectations of the school showed that more students felt that Northwest made students want to learn, that students at Northwest were serious about their education, and that at Northwest there was a "strong push for high academic achievement."

NORTHWEST GUILFORD HIGH SCHOOL ALGEBRA IA AND IB PROGRAM

Introduction

In the past, North Carolina high school students had the option of taking general math and consumer math classes to obtain their math credits. Starting with the high school graduating class of 1996, all North Carolina students will be expected to take and pass Algebra I (North Carolina State Department of Instruction, 1992). Knowing this change was about to take place, two building administrators at Northwest High School instituted an algebra program for low achieving high school students during the 1991-92 school year.

Mr. Roger Nelson and Dr. Jean Tillman were most concerned that minimally motivated high school students at their school receive the instruction and encouragement they needed to learn the algebra material and pass the course. They looked at other alternative algebra programs around the state and came up with a plan that met the state's requirements and which they felt would meet the needs of their students.

To be eligible for the program, students had to score below the 40th percentile (below grade level) on the 8th grade math portion of the California Achievement Test. The algebra program the administrators designed was a two-year course (Algebra IA and Algebra IB); a one-year algebra class was stretched into two. A programmed text was adopted so students could move at their own pace and experience some academic success. One math teacher on staff taught every Algebra IA class and a colleague taught all the algebra IB classes. The text was made up of study units; each unit of study contained a packet of materials for students to complete. When students finished a unit, they took a test. To pass the unit, students had to answer correctly 90 percent of the unit test items, but they had the option of retaking the test if they failed it the first time. For three days a week, students worked in their packets and conferred individually with the teacher. For one a day week, the students received instruction and drill on the computer. On the final day, they participated in "hands on" mathematics activities. Each of these classes was assigned a student math assistant to help the teacher and the students. There was no homework, unless requested by a student, and students left their textbooks in the classroom. The minimum grade students could receive in the class was a "C"; if students did well on the End of Course Algebra test they could get higher than a "C" on their report card. Students lost academic credit if they were off-task in the classroom. Algebra IA students attended a Guided Studies class during another period which offered tutoring assistance in math is needed. For the first time, Algebra IB students took the End Of Course Algebra I test mandated by the state of North Carolina in the spring of 1993.

Evaluation

Two SERVE evaluators interviewed the two NWHS building administrators individually about the history of the two-year Algebra I program. The teachers were asked to state its strengths and weaknesses. Students in two Algebra IA classes (n=17, n=18) and one Algebra IB class (n=17) completed questionnaires developed by the evaluators. The questionnaires were comprised of Likert Scale statements and open-ended questions and which centered on student attendance, attitude and interest in math, high school grades, strengths and weaknesses of their algebra program. The two evaluators observed IA and IB classes and recorded teacher interaction with students, student responses, type of instructional methods used by the teachers, and descriptions of classroom settings.

Results

Both teachers associated with the alternative algebra program said it was working; students were being pushed more and making progress. They commented that the students were amazed at what they were able to accomplish in math class. The teachers were concerned about the high rate of student absenteeism and misbehavior, the high cut-off score for passing the End of Course test, the lack of homework, and that students only had two years to complete the course. The IA teacher placed emphasis on increasing student self-esteem (verbally praising students for high test marks, posting high achievers' names on a wall) and academics; the IB algebra teacher focused entirely on academics.

End of Course results for Algebra IB students were disappointing. Of the 42 students taking the test, 34% received a "F", 26% received "D", 31% received a "C", and 10% received a "B".

Based on the questionnaire administered to Algebra IA and IB students on May 7, 1993, students said they received mostly "C's" on their report cards. Two-thirds of the students (n=52) did not enjoy math, did not think they were good at math, and did not think math was interesting. According to students, their attendance had been good; a majority said they had missed less than 11 days of class. If they received outside assistance in algebra, a majority received it from a friend or family member. Seventy-seven percent of the Algebra IB students (n=17) said they had learned a lot in math this year. What students liked most about math class was the computer instruction and working at their own pace. Students disliked math class because some of the activities were boring, the work and tests were too hard, the teacher was mean, and class rules were too strict.

Reccmmendations

Across the United States, high graduation requirements are being raised. With higher standards, there is the possibility that low achieving high school students will become even more alienated from school and drop out because they are unable to do the academic work.

The Algebra IA and B program attempts to challenge and support low achieving math students, provide a more successful school experience for them, and to meet higher graduation standards. This was done by giving students a longer period of time to complete the Algebra I curriculum, having them work in a "no fail" situation and at their own pace, having tutors, and exposing students to a variety of instructional techniques (programmed instruction, computer, manipulatives).

Specific recommendations are:

- an increased emphasis on student self-esteem in Algebra IA and IB classrooms accompanied by an incentive program to reward academic progress. Incentives could also be used for excellent attendance and good behavior.

- student assistants assigned to these classrooms should have a strong background in math. Student assistants should be utilized by the teachers.

- there should be an opportunity for students to make "A's" and "B's" on their tests and report cards.

- there needs to be more teacher/student interaction in these classes. Teachers should present math concepts to the entire class on a regular basis.

NWHS Student Algebra IA and IB Survey Results - May 7, 1993 *

1. Is the work you do for your math class -

Response Category	*Algebra IA (n=17)*		*Algebra IA (n=18)*		*Algebra IB (n=17)*	
too easy	1	(6%)	2	(11%)	1	(6%)
somewhat easy	2	(12%)	0	(0%)	5	(30%)
just right	11	(65%)	8	(45%)	3	(18%)
somewhat difficult	3	(18%)	8	(45%)	7	(41%)
too difficult	0	(0%)	0	(0%)	1	(6%)

2. How many days of math class have you missed this year?

Response Category	*Algebra IA (n=17)*		*Algebra IA (n=18)*		*Algebra IB (n=17)*	
0-5	3	(18%)	7	(39%)	8	(47%)
6-11	10	(59%)	5	(28%)	2	(12%)
12-17	0	(0%)	3	(17%)	4	(24%)
18-23	1	(6%)	0	(0%)	3	(18%)
23+	3	(18%)	3	(17%)	0	(0%)

3. What have been your report card grades this year?

Response Category	*Algebra IA (n=17)*		*Algebra IA (n=18)*		*Algebra IB (n=17)*	
A	0	(0%)	0	(0%)	1	(6%)
B	2	(12%)	7	(39%)	4	(24%)
C	12	(71%)	10	(56%)	12	(71%)
D	2	(12%)	0	(0%)	0	(0%)
F	1	(6%)	1	(6%)	0	(0%)

4. Most of the time I enjoy math class.

Response Category	*Algebra IA (n=17)*		*Algebra IA (n=18)*		*Algebra IB (n=17)*	
True	6	(35%)	12	(67%)	4	(24%)
False	11	(65%)	6	(34%)	13	(77%)

* Percentages rounded off.

5. I think I am good at math.

Response Category	*Algebra IA (n=17)*		*Algebra IA (n=18)*		*Algebra IB (n=17)*	
True	6	(35%)	12	(45%)	4	(35%)
False	11	(59%)	6	(45%)	13	(65%)
No Response	1	(6%)	2	(11%)		

6. Math is interesting.

Response Category	*Algebra IA (n=17)*		*Algebra IA (n=18)*		*Algebra IB (n=17)*	
True	5	(30%)	9	(50%)	4	(24%)
False	12	(71%)	8	(45%)	13	(77%)
No Response			1	(5%)		

7. I have learned a lot about math this year.

Response Category	*Algebra IA (n=17)*		*Algebra IA (n=18)*		*Algebra IB (n=17)*	
True	8	(47%)	9	(50%)	13	(77%)
False	9	(53%)	8	(45%)	4	(24%)
No Response			1	(5%)		

8. I have always liked math.

Response Category	*Algebra IA (n=17)*		*Algebra IA (n=18)*		*Algebra IB (n=17)*	
True	7	(41%)	6	(34%)	2	(12%)
False	10	(59%)	11	(62%)	15	(89%)
No Response			1	(4%)		

9. What assistance, if any, have you gotten in math this year?

Response Category	*Algebra IA (n=17)*	*Algebra IA (n=18)*	*Algebra IB (n=17)*
teacher	1	1	0
family	9	4	3
friend	7	6	9
private tutor	2	3	2
school tutor	3	2	0
none	2	5	5

* Multiple responses were allowed.

10. What you like most about your math class?

Response Category	*Algebra IA (n=17)*		*Algebra IA (n=18)*		*Algebra IB (n=17)*	
Computers	3	(18%)	3	(17%)	3	(18%)
Easy	1	(6%)	0	(0%)	0	(0%)
Work at own pace	5	(42%)	0	(0%)	4	(24%)
Variety of instruction	1	(6%)	0	(0%)	1	(6%)
Friends	1	(6%)	2	(11%)	0	(0%)
No homework	1	(6%)	0	(0%)	3	(13%)
Fun	0	(0%)	1	(6%)	0	(0%)
Room temperature	0	(0%)	0	(0%)	1	(6%)
Teacher	0	(0%)	0	(0%)	1	(6%)
No Response	5	(29%)	12	(67%)	4	(24%)

12. What do you like least about your math class?

Response Category	*Algebra IA (n=17)*		*Algebra IA (n=18)*		*Algebra IB (n=17)*	
No help	0	(0%)	0	(0%)	1	(6%)
Strict rules	2	(12%)	0	(0%)	2	(12%)
Amount of work	3	(18%)	2	(11%)	2	(12%)
Lengthy period	1	(6%)	0	(0%)	0	(0%)
Instruction	3	(18%)	0	(0%)	3	(18%)
Teacher	5	(30%)	5	(28%)	0	(0%)
Tests	1	(6%)	1	(6%)	1	(6%)
Wrong period	1	(6%)	0	(0%)	0	(0%)
Too hard	1	(6%)	1	(6%)	0	(0%)
Packets	0	(0%)	1	(6%)	0	(0%)
Hate math	0	(0%)	0	(0%)	2	(12%)
Too easy	0	(0%)	0	(0%)	1	(6%)
Grading	0	(0%)	0	(0%)	2	(12%)
Computer	0	(0%)	0	(0%)	1	(6%)
No Response	0	(0%)	8	(44%)	2	(12%)

GUIDED STUDIES PROGRAM AT NORTHWEST GUILFORD HIGH SCHOOL

Introduction

The Guided Studies Program is located in a trailer unit outside the main NWHS building. During the school day there are 15 to 20 students per class period, a teacher, and a student assistant in the classroom. In the classroom there are students desks, several tables, some computers, reference materials, and an area for teacher study guides. The purposes of the Guided Studies Program are threefold -- to assist students in passing the competency exam, in passing their core classes, and in improving their self-esteem.

Teacher

Mrs. Phyllis Smith, a veteran teacher with experience in working with at-risk students, coordinates the Guided Studies Program. Based on evaluator observation, she is upbeat and personable. Mrs. Smith supports the students and relates well to them. She provides a relaxed classroom atmosphere where students feel comfortable and are not afraid to ask for help. Mrs. Smith sees some of the students who are enrolled in the Guided Studies Program as lacking in self-discipline and/or having little parental support. Some of these students can have a difficult time attending to work, are often off task, are unable to set priorities, and have memory lapses (i.e., forgetting what they have learned). She tries various instructional strategies with her students, recognizing they have different learning styles. Mrs. Smith feels like her students feel positively about their placement in the Guided Studies Program.

Enrollment

Most of the students enrolled in the Guided Studies Program are 9th graders. The motto is "Catch them while they are young." When students are selecting their classes for the upcoming year, they can request to be scheduled into the Guided Studies Program if they feel like they need assistance with academics; they can also be scheduled in by a counselor if they have failed a class or the competency exam.

Student Assistants

Two student assistants in the Guided Studies Program were interviewed. Their reason for becoming a student assistant was because they liked people. At NWHS, there is a Sis-Bro Club where students are trained by the guidance counselor to help teachers in their classrooms. Training consists of folder activities, study skills review, viewing videos, and attending meetings. Students receive class credit for being student assistants and are assigned to a classroom for one period of each class day. Based on

evaluator observation, the assistants worked well with the students. Assistants tutored students individually; they kept them on task and directed them in a positive, but firm manner.

Student Evaluation

Eight students enrolled in the Guided Studies Program were interviewed. Here were their general comments:

- More tutors are needed.
- Class time should be longer.
- Mrs. Smith and the tutors keep me from failing.
- The tutors slow things down so I can understand them.
- They help us learn.
- My grades have improved.
- I am now able to pass the competency exam.
- Mrs. Smith and the tutors calm me down so I won't be nervous when I take tests.

The students were asked, "What would happen if you were not in the Guided Studies Program?"

- I would be failing. (six students)
- I would still be getting D's. (two students)
- I would not have passed the competency exam. (one student)
- I would not be getting my homework done. (one student)

Recommendations

This well-organized program meets the short term academic needs of students. It has a teacher and student assistants that understand the needs of at-risk students, an effective teacher study guide component, and computer assisted learning.

The students that are enrolled in the Guided Studies Program appear to fall into three categories: unmotivated or unfocused students, intellectually slow students, and students with learning disabilities. There is a need to meet the long term academic needs of these students. Recommendations include:

- o the initiation of intensive math and reading programs to get students up to grade level in these academic areas.
- o the inclusion of motivational and study skills series.
- o study carrels should be added to assist those students who have difficulties focusing on their studies.

Other Evidence That Might Be Beneficial To These Reports

Due to limited resources and time considerations, several analyses which might have shed some light on the impact of the programs were not able to be conducted. These analyses are discussed below.

Heterogeneous Grouping

Student Classroom Achievement

It would be good to look at student grades in the heterogeneous classes. There are two ways to accomplish this task. The first is to look at the number of A's, B's, etc. in each class across each school year. (This analysis was actually done after the first year.) The second would be to compare individual students grades in lower level classes of similar subject area to their grades in the heterogeneous classes. For example, a comparison of students' grades in General English I to their grades in Heterogeneous English II. These analyses address the issues of whether or not more students are failing classes since taking higher level classes, whether or not students can handle higher level work, and whether or not students are learning more.

End Of Course Test Scores

Although increasing test scores was not a goal of heterogeneous grouping, it might be worthwhile to look at the means and variances as unanticipated results. The reason for looking at variances is that while a test score mean may stay about the same, the variance of a test score may decrease indicating that students are not as disparate regarding their achievement. In the case of heterogeneous grouping this result would imply that the learning gap between pre-college and vocational students had narrowed. It might also be worthwhile to break down test scores by course of study to note any changes in mean score within each course of study. It is possible for sub-group means to increase while the overall mean is stable or declines. This phenomenon is known as "Simpson's Paradox" (Simpson, 1951; Wainer, 1986; Mitchem, 1989).

You need to keep in mind that standardized test scores are typically not sensitive enough to detect program effects (Welch, 1979; McColskey, Harman, Weaver, and Fortune, 1993). Often standardized test scores actually go down when a program is first implemented as teachers and students adjust to a new program (Eichelberger, 1992).

Student Behavior

Since reducing student anti-social behavior was one of the goals for heterogeneous grouping, it really needs to be addressed in the evaluation report. You did collect data on discipline

referrals before and after the first year. It is important to assess whether this trend of fewer discipline referrals continued.

Course Selection

Another goal of heterogeneous grouping was that students would take higher level courses to better prepare them for post-secondary education. Of course, students are taking at least eight higher level courses but it would be informative to see if they started taking other higher level courses, such as Algebra II and Chemistry for example. SIMS data would be useful for this analysis.

Algebra IA and IB classes

An interesting analysis would be to compare End Of Course Algebra I test scores of those students who scored between the 40th and 50th percentile on the CAT and those IB students who scored between the 30th and 40th percentile on the CAT. This analysis would give an indication of the benefit of taking Algebra I over two years. You also might want to look at the classroom grades of those students who scored between the 40th and 50th percentile on the CAT. This information would also provide some indication of the need to take Algebra I over two years.

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